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A DESCRIPTION OF THE LARVA OF *DERALLUS* *RUDIS* SHARP (COLEOPTERA: HYDROPHILIDAE)¹

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For many years the placement of *Derallus*, *Regimbartia* and *Globaria* in the tribe Berosini was questioned by systematists but probably not changed because the larvae were not definitely known. However, Bertrand (1962) described a hydrophilid larva (his Type D) from Africa which he assigned to the *Derallus* group and which he included in the subfamily Hydrobiinae. Bertrand stated that he placed his African larva in the *Derallus* group of hydrophilid larvae at the suggestion of J. Balfour-Browne of the British Museum who, when he examined the African larva, associated it with American larvae that he believed to be *Derallus*.

For several years I looked for larvae associated with *Derallus* adults that might represent the genus. On August 10, 1964, at Alvarado, Veracruz, Mexico, I found larvae new to me and which were associated with adults of *Derallus*. I suspected that these were *Derallus* larvae and six were kept alive for rearing and twelve others were preserved for study. Five of the six larvae kept for rearing died from excessive heat while enroute to Washington, D. C. The larva that survived pupated in my office sometime during my absence on September 16 and 17, 1964. When I discovered the pupa on Friday, September 18, the eyes were dark red indicating that eclosion probably would occur during the weekend. Therefore, I made a few hasty notes on the number of styli on the head and pronotum and rushed the pupa to the photo lab to obtain a photographic record of the pupal stage. Unfortunately, eclosion occurred while the specimen was lying on the stage as the camera was being adjusted. As a result, only a photo of the teneral adult and cast off pupal skin (fig. 1) was obtained. The larva definitely proved to be the immature stage of *Derallus*.

The similarity of the *Derallus* larva to that of Bertrand's African larva (either *Regimbartia* or *Globaria*) is striking and supports the separation of these three genera from the Berosini. It also indicates that Balfour-Browne correctly assigned the American larva to *Derallus*.

Because this is apparently the first *Derallus* larva reared to confirm its identity, the larva is described below.

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Figure 1. Fossilized shark, showing head and tail.

DESCRIPTION OF LAST-INSTAR LARVA OF *DERALLUS RUDIS* SHARP
(FIGS. 2-11)

Total length, 5.8 mm.; width of prothoracic segment 1.0 mm. Color creamy yellow with sclerotized portions light yellowish brown. Integument covered with minute, irregularly arranged asperities.

Head quadrangular (fig. 8); 0.65 mm. wide; 0.45 mm. from labroclypeus to occipital foramen. Frontoclypeal suture absent. Ecdysial cleavage lines present, arising near outer angle of cervical sclerites and curving gently to bases of antennae. Frons broadly U-shaped. Cervical sclerites present, subrectangular in shape. Dorsal surface of head glabrous except 2 short setae each side of midline on a line between bases of antennae. Ventral surface of head glabrous except for 2 long setae below each ocular area and 1 long seta each side of midline at midlength; gula triangular; 2 tentorial pits in gular suture (fig. 9).

Labroclypeus (fig. 6) symmetrical; with 3 minute (magnified 90x) teeth medially and 3 minute teeth on inner side of feeble anterolateral projections of epistoma; each tooth separated by a small seta.

Ocular areas with 6 ocelli arranged in 2 oblique rows; anterior row of 4 ocelli, 3 large and 1 (innermost) small; posterior row of 2 large ocelli.

Antenna moderately long, subcylindrical, slightly longer than length of stipes. First segment sinuate, longer than remaining 2 segments combined and with a small, seta-bearing appendage on inner apical angle. Penultimate segment curved inward, bearing a stout seta as long as ultimate segment on outer apical angle and 2 fine setae on inner apical angle. Ultimate segment almost a fourth as long as penultimate segment and bearing 3 setae on apex.

Mandibles symmetrical, prominent, slender, sharply pointed apically. Each mandible with 1 large and 1 medium tooth. Molar area smooth and gently rounded.

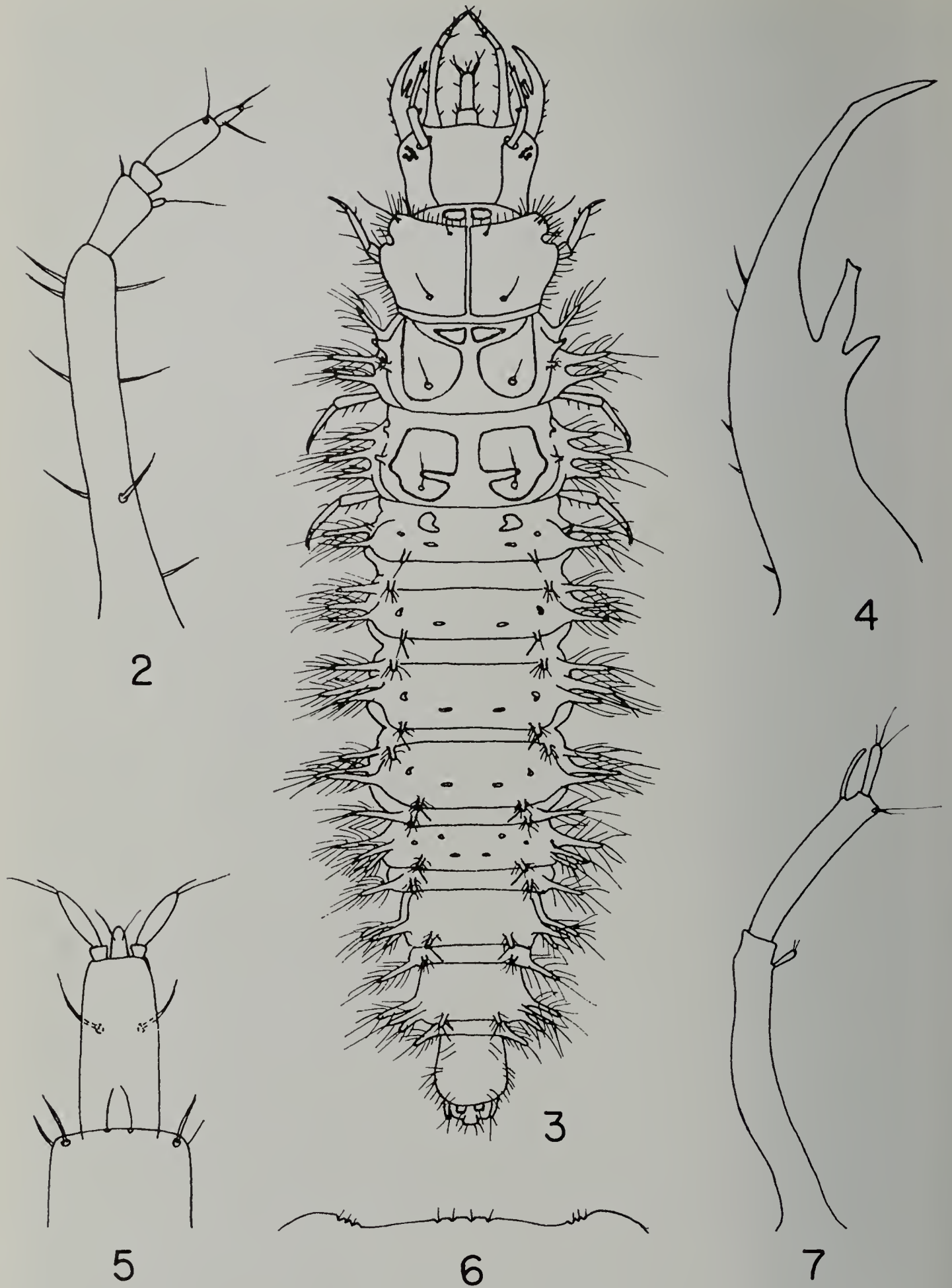
Maxilla with stipes slender, elongate and nearly parallel-sided, tapering distally and bearing row of 4 slender setae on inner and 4 slender setae on outer margin. Palpifer about as long as penultimate segment, with slender appendage about half as long as first segment of palpus on inner apical angle and a long, slender, terminal seta. Palpus tapering distally; first segment short and only a third as long as second segment; penultimate segment 3 times longer than ultimate segment, with a long slender seta on outer apical angle; ultimate segment at base with 1 long slender seta on inner side and 2 short setae on apex.

Labium extending as far forward as palpifer. Penultimate segment of palpus short. Ultimate segment 4 times as long as penultimate segment, with 2 terminal setae of unequal length. Ligula distinct, twice as long as penultimate segment of palpus, with 2 slender setae arising from midlength. Palpiger rectangular, ventrally 2 setae arising just beyond midlength. Mentum wider than palpiger, with 2 setae on each anterolateral angle and 1 seta each side of midline.

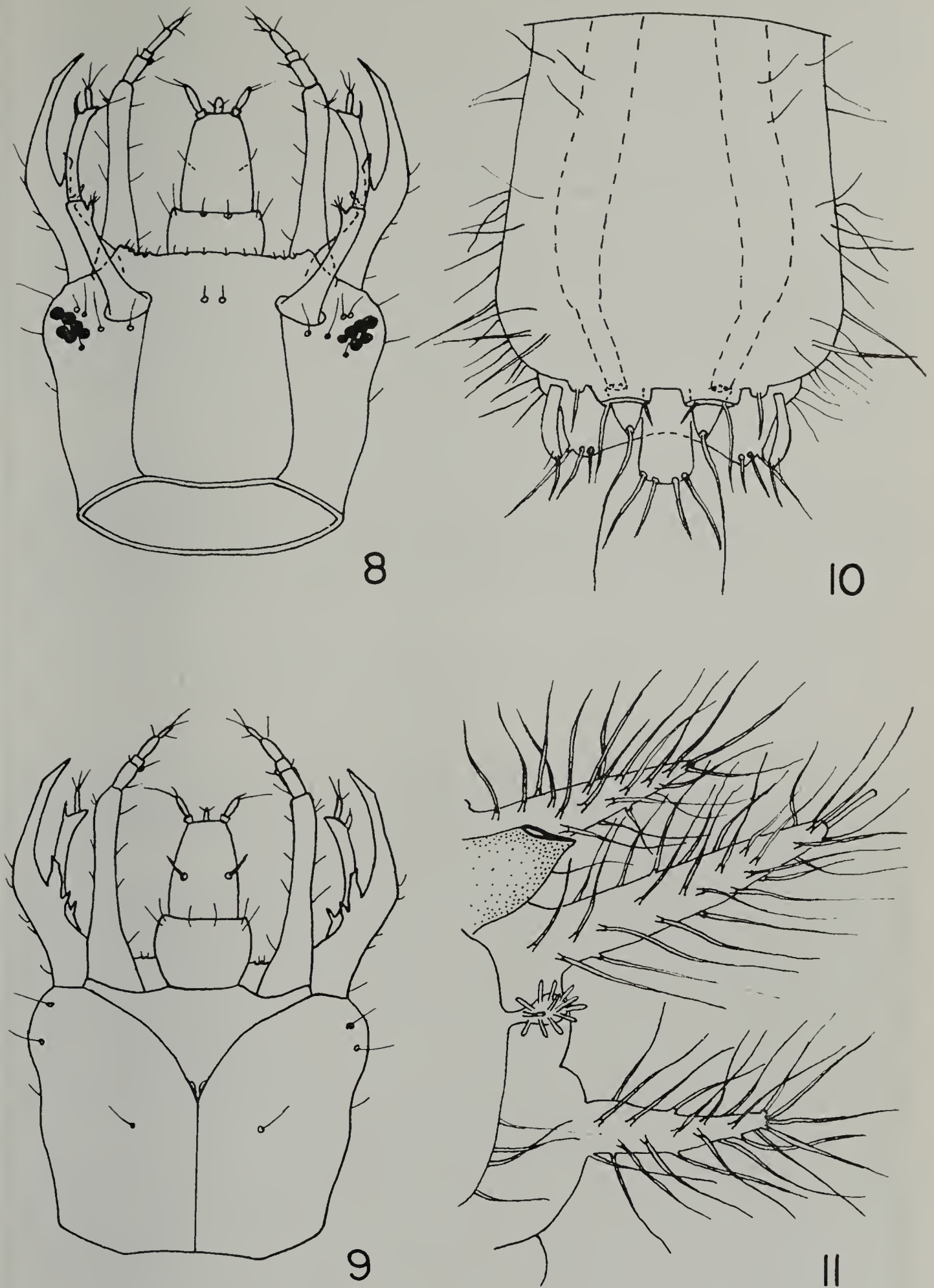
Prothorax broader than long, with sides emarginate at apical two-thirds, widest at midlength. Anterior and lateral margins fringed with slender setae. Sagittal line present. Prosternal sclerite broader than long, without sagittal line, with numerous setae scattered over surface. Mesothorax slightly wider than and about as long as prothorax; with 2 small, nearly triangular, anterior sclerites and 2 large, almost pear-shaped posterior sclerites; lateral margins each with prominent spiracular tubercle, minute setose tubercle and 3 large, setiferous gills (fig. 11). Metathorax as wide as mesothorax; with 2 large sclerites, each bearing a stout seta; and 3 large setiferous gills as illustrated (fig. 3).

Legs 4-segmented, a fourth longer than width of prosternal sclerite; coxae widely separated; transverse trochanter about half as long as coxa; femur about as long as tibiotarsus; tarsal claw single, slender seta arising at middle and extending to or slightly beyond apex of claw.

Abdomen with 8 distinct segments; ninth and tenth segments reduced. Segment 1 with pair of small oval sclerites anteriorly. Other segments without sclerites and separated by intersegmental membrane. First segment with distinct spiracular tubercle and 3 large setiferous gills laterally and 1 small setose tubercle on each side



FIGURES 2-7—*Derallus rudis* Sharp, larva. 2—Left maxillary palpus, dorsal view. 3—Habitus view. 4—Left mandible, dorsal view. 5—Labium, dorsal view. 6—Labroclypeus, dorsal view. 7—Left antenna, dorsal view.



FIGURES 8-11—*Derallus rudis* Sharp, larva. 8—Head, dorsal view. 9—Head ventral view. 10—Atrium, dorsal view. 11—Mesothoracic segment, right side, dorsal view.

of midline on hind margin. Segments 2 through 6 each with 2 folds; first fold with 1 small setose tubercle and 1 large setiferous gill laterally; second fold with 3 large setiferous gills laterally and 1 small setose tubercle on each side of midline on hind margin laterally. Eighth tergum represented by superior valve of stigmatic atrium, a large subquadrangular sclerite with 4 appendages on caudal margin as illustrated (fig. 10). Ninth tergum trilobed; middle lobe rectangular, with 4 long setae on caudal margin; lateral lobes less distinct, with 3 setae on each posterolateral angle. Spiracles present. Mesocerci prominent, conical, with 1 seta arising ventrally at apex. Paracerci present, flattened, apices incurved, unsegmented and each with 1 large and 1 minute seta on apex.

Habitat: *Derallus* larvae were collected with adult *Derallus* in dense emergent vegetation in a temporary pond (fig. 12) close to the beach at Alvarado, Mexico.

Other genera of water beetles associated with *Derallus* were: Hydrophilidae—*Enochrus*, *Hydrophilus*, *Paracymus*, *Tropisternus*; Dytiscidae—*Copelatus*, *Hydrovatus*, *Laccophilus*, *Megadytes*, *Pachydrus*, *Thermonectus*; Noteridae—*Hydrocanthus*, *Suphisellus*; Dryopidae—*Pelonomus*.

The larva of *Derallus* runs to the second rubric of couplet 5 in Leech and Chandler's (1956:339-340) larval key because the first antennal segment is distinctly longer than the following two segments combined (other characters in the rubric are not all valid for *Derallus*). The following couplet will separate *Derallus* from the other genera that run to the second rubric in couplet 5.



FIGURE 12—Habitat of *Derallus rudis* Sharp at Alvarado, Veracruz, Mexico.

Mesothorax, metathorax and abdominal segment 1 each with 3 setiferous, lateral gills; abdominal segments 2 through 6 each with four moderately long, setiferous, lateral gills; femur without fringe of long swimming hairs-----DERALLUS
 Gills absent or, if present, with only a single lateral gill on each side of abdominal segments; femur with fringe of long swimming hairs----Leech and Chandler's couplet ----- 12

Because of the urgent need to get the *Derallus* pupa to the photo lab I hesitated only long enough to count the styli on the head and pronotum. The pupa had 2 styli along the inner margin of each eye and 24 styli on the pronotum.

I am indebted to Mr. J. Balfour-Browne of the British Museum for lending a male of *Derallus rudis* from Sharp's type series. My reared male agrees very well with the cotype in sculpture and in the distinctive shape of the male genitalia.

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LITERATURE NOTICE

ITINERARIES OF THE WHEELER SURVEY NATURALISTS: HENRY WETHERBEE HENSHAW. By F. M. Brown. Jour. Lepid. Soc. 20(2): 71-82, 8 tables. 1966.—Many species of insects were collected on the U. S. Geographical Surveys West of the 100th Meridian and were then described as new by entomologists. Brown has realized the importance of determining more exact localities than given in the reports or descriptions and has researched the itineraries. He previously reported on the Wheeler Survey itineraries of Theodore L. Mead (Lepid. News 9:185-190, 1956) and Ferdinand Bischoff (Jour. New York Ent. Soc. 65:219-234, 1957).

CYTOLOGICAL SPECIES-SEPARATION IN ASIATIC EXOCHOMUS (COLEOPTERA: COCCINELLIDAE). By S. G. Smith. Canad. Jour. Genetics and Cytology 7:363-373, 22 figs. 1965.—Chromosomes of two species were studied. The chromosomes indicate that three species exist. The three species are externally very similar or identical. This study is a portent of things to come—the new systematics.